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Mare Island, California
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DOCUMENTS SECTION

Committee on Artificial Limbs
National Research Council
2101 Constitution Avenue
Washington 25, D. C.

MONTHLY REPORT OF THE EXPERIMENTAL WORK AT THE ARTIFICIAL LIMB SHOP,
MARE ISLAND NAVAL HOSPITAL

During the (month of November) an additional machinist was hired and we are now endeavoring to hire an engineer, a draftsman and clerical help to carry on the work. Following projects are now being worked on:

1. FUNCTIONAL ANKLE JOINT:

Fourteen additional ankle joints have been installed for field testing. The ankle bolt on the prosthesis of Prof. Eberhart has broken and we believe a tall, heavy man with the subsequent increase leverage should have an ankle bolt made of three-eighths stock instead of the five-sixteenths. We have observed that with short below knee stumps, above knees and bilateral amputees, there is need for a much stiffer front bumper and the amount of motion desirable in bilaterals is much less than is the unilateral case. This is easily obtained by simply tightening down the bolt. Work continues on the re-design of the ankle block which is being fabricated from metal by hand.

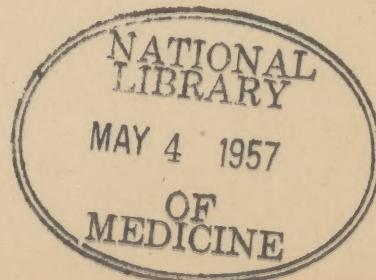
2. DIES FOR COSMETIC COVERING FOR LOWER LEG:

We have completed the stocking of poly-vinyl chloride for the covering of the lower leg and ankle and have utilized sponge rubber as a filler over the hard plastic shin. The female patient using the shin is well pleased with this cosmetic appearance and softness. It is now undergoing field testing.

3. SUCTION SOCKETS:

(a) Above Knee: Three additional suction sockets have been fitted for field testing. A number of bilaterals are in process of being fitted with suction sockets. We are preparing to receive the physicians and limb manufacturers for the suction socket school beginning 8 December 1947.

(b) Below Knee: A bilateral below knee amputee has been fitted with suction sockets in conjunction with the soft bucket and functional ankles. We are still searching for a suitable plastic substitute for the horsehide liner. We intend to try a poly-ethylene plastic for this purpose.



(c) Below Elbow: A new below elbow suction socket has been manufactured of a semi-rigid plastic material for the bucket. This material appears to be better than the rigid plastic.

(d) Above Elbow: Additional above elbow buckets are being fitted.

4. CINEPLASTIC ARMS:

Two additional cases having cineplastic motors similar to Mr. Strong, have been fitted. The cable housing at the wrist has been lengthened and fixed to a cross bar from the wrist joint which overcomes the necessity of using a cable extensor in conjunction with a wrist flexor-extensor. This allows the arm amputee to fully open his hook even with the wrist in full extension.

5. PRONATOR & SUPINATOR FOR ABOVE ELBOW:

The field testing of five models of this mechanism are proving successful. We are re-designing the pull bars which have proven to be too weak and readily bend thus jamming the mechanism. We believe that the above the elbow voluntary, pronator & supinator can be successfully installed in an elbow (below) amputee and will thus give pronation and supination to the many cases who cannot utilize the Northrop pronator and supinator.

6. ROBINSON HAND & COSMETIC GLOVE:

Additional amputees are being fitted with the Robinson hand and the cosmetic glove and we are continuing to install locks on the older models which are being recalled from field testing, for inspection.

7. SOFT BUCKETS AND IMPRESSION METHODS FOR BELOW KNEE STUMPS:

We are continuing to fit below knee and arms with the soft bucket. We have yet to receive an adverse comment from any amputee using it.

8. SELECTRON WITH FORTISAN LAMINATE:

We have recently cut down the number of fortisan laminate from seven to six and further intend to gradually lower this number to the point where field testing will show breakage. This will give us a figure for basis of the minimum requirements of thickness and strength necessary in the plastic shin. Two shins with feet and ankles attached are being set up for the University of California for testing in their walking machine.

9. PRODUCTION METHODS FOR LIMB MANUFACTURING:

Production studies are continuing in order to shorten the time necessary to provide an amputee with a completed prosthesis.

10. TILTING TABLE PROSTHESIS:

Two tilting table prostheses are being built and we are designing several variations of a mechanical type. Mr. Oliver through arrangements with the CAL intends to furnish us a hydraulic leg which we intend to incorporate in the tilting table prosthesis. We believe that either the mechanical knee lock or the hydraulic knee lock is desirable in certain types of cases.

11. NEW TYPE JOINT FOR ELBOW, WRIST AND HIPS:

We have installed a number of elbow joints which are proving very successful and appear to have decided advantage over the rigid type of joint used in the elbow. We have removed this functional joint from the below knee prosthesis principally because no weight bearing was permitted through the lacer and no lateral stability was obtained. The study of the action of the functional joint incorporated on both the knee and the elbow has changed our knowledge considerably on both the function and motion that occurs in these joints. The amputee using this type joint demonstrates great variation from the conventional alignment of the joints and the motions and axis shifting that occurs in all three dimensions.

12. ABOVE KNEE JOINTS:

The 75-ST aluminum joints are proving successful in field testing and we are designing a simple knee lock to be incorporated with the brake.

13. SUCTION SOCKET VALVES:

It has been suggested to Mr. Murphy and Mr. Motis that the suction socket valve retainer sleeve be re-designed to include an outer flange thread and an inner threaded flange. This is necessary in order to utilize a valve in below knee and arms for suction sockets when using a soft socket.

14. ABOVE KNEE BLOCK:

It has been necessary to redesign the knee block when used with the suction socket in order to remove the knee mechanism from behind instead of through the bucket, should servicing of the joint be required.

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